

## ABSTRACT

A switching power source apparatus can reduce the size of a transformer and realize the zero-voltage switching of a switch. The apparatus is compact, highly efficient, and low in noise. The apparatus has a series circuit connected to each end of a DC power source ( $V_{dc1}$ ) and including a primary winding (5a) of a transformer (T) and a main switch (Q1), a rectifying-smoothing circuit to rectify and smooth a voltage that is outputted from a secondary winding (5b) when the main switch (Q1) is turned on, a series circuit connected to each end of the primary winding (5a) and including an auxiliary switch (Q2) and a clamp capacitor (C1), a series circuit connected to each end of the main switch (Q1) and including a diode (Dx1) and a snubber capacitor (Cx), a series circuit connected to a node between the diode (Dx1) and the snubber capacitor (Cx) and a node between the auxiliary switch (Q2) and the clamp capacitor (C1) and including an auxiliary winding (5x) and a diode (Dx2), and a control circuit (10) to alternately turn on/off the main switch (Q1) and auxiliary switch (Q2). When the main switch (Q1) is turned on, the snubber capacitor (Cx) is discharged through the auxiliary winding (5x) to the clamp capacitor (C1). When the main switch (Q1) is turned off, the snubber capacitor (Cx) is charged, to relax the inclination of a voltage increase of the main switch (Q1).